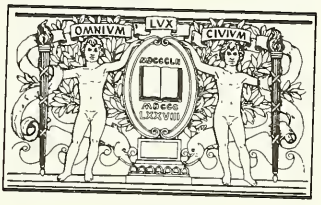

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Harvard University
Allston Campus Master Plan

Parking and Circulation Management and Mitigation Plan

Harvard University Planning Group

April 1989

Harvard University
Allston Campus Master Plan

Parking and Circulation Management and Mitigation Plan

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I. Introduction

A. Purpose

The Interim Planning Overlay District (IPOD) regulations for Allston-Brighton require the preparation of a Five Year Master Plan for the University. As part of that Master Plan requirement, a Parking Management and Mitigation Plan is identified as a component piece. This document represents that component piece for the Allston Campus. In addition, because parking and circulation are inevitably intertwined, the University has addressed traffic issues and mitigation measures as well. The companion documents to this report are the Harvard University Allston Campus Master Plan and the Harvard University Allston Campus Master Plan Summary.

This document identifies specific parking requirements for Five Year Plan program elements and certain roadway improvements that could beneficially influence the existing roadway network serving the University and adjacent neighborhoods. It is intended that these parking requirements and roadway improvements establish a common basis for subsequent project level review by the Planning and Zoning Advisory Committee (PZAC), Boston Redevelopment Authority (BRA) and Zoning Board of Appeals (ZBA). In addition, the University intends that the data provided be used by the PZAC and BRA for related IPOD studies such as the Western Avenue Boulevard Plan and area-wide traffic studies.

B. Summary of the Five Year Plan

The following descriptions are provided to give a general understanding of the key elements of the Five Year Plan which affect traffic and parking. Figure 1, Five Year Plan, locates the program elements of the plan. For a more detailed discussion, please refer to the full report entitled the Harvard University Allston Campus Master Plan.

Five Year Plan Projects

Harvard Business School

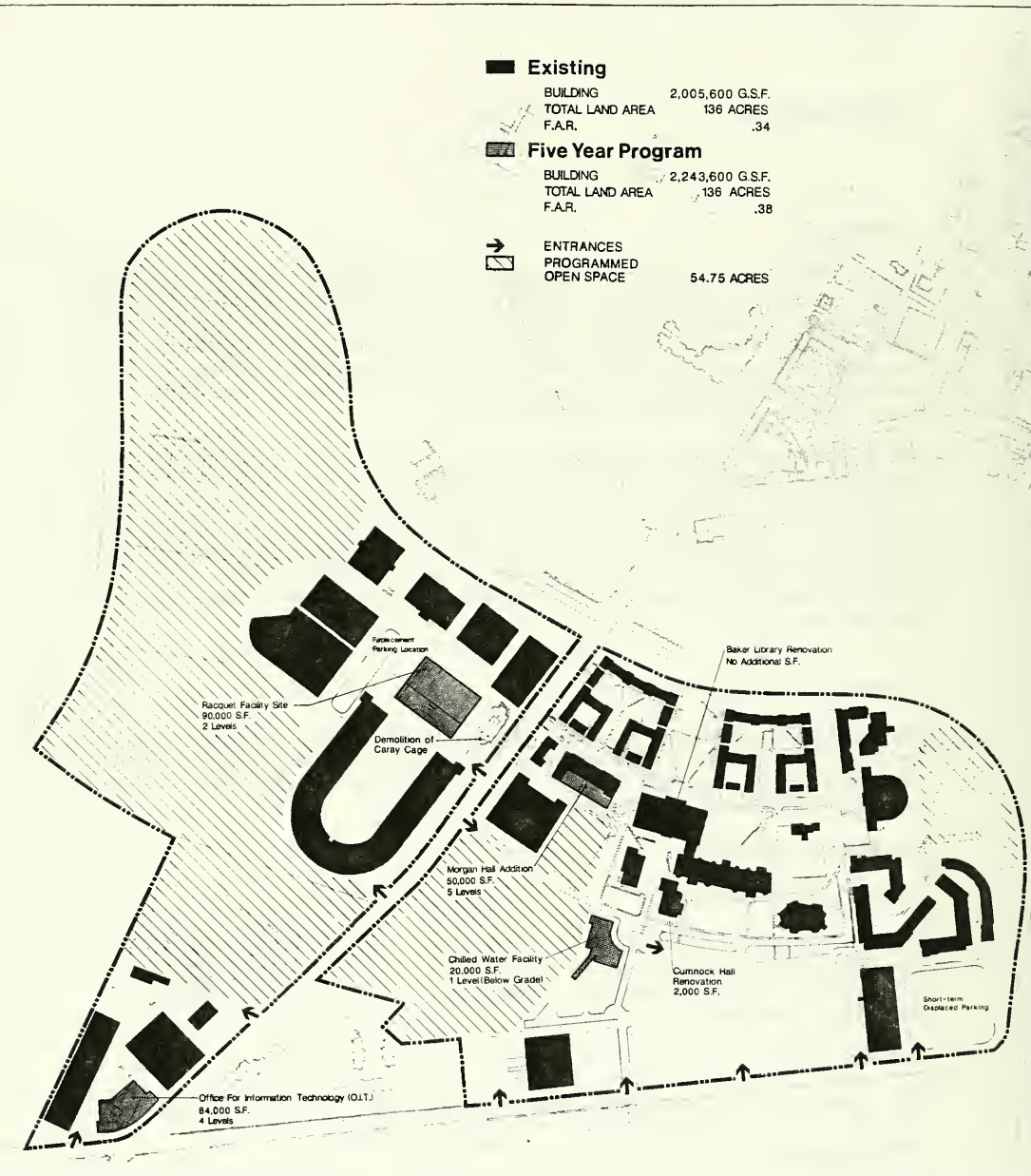
Construction of a chilled water plant	20,000	gsf add'l.
Renovation of Cumnock Hall for emeritus faculty offices	2,000	gsf add'l.
Renovation and addition to Morgan Hall forfaculty offices	50,000	gsf add'l.
Renovation of Baker Library		n.a.

University

Construction of a building for the Office of Information Technology	84,000	gsf add'l.

Athletics/Recreation

Construction of a racquet sports facility	90,000	gsf add'l.
Demolition of Carey Cage	- 8,000	gsf removed
	238,000	gsf total



Harvard University
Allston Campus Master Plan

Five Year Plan

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Figure 1

II. Exisiting Traffic and Parking Conditions

A. Traffic

The Allston campus of Harvard University is afforded excellent regional traffic access via the Massachusetts Turnpike located to the west of the campus; State Routes 2 and 2A to the north of the campus and Soldiers Field Road to the immediate west, north and east of the campus. More localized campus access is provided by North Harvard Street, which bisects the campus on a north-south alignment and by Western Avenue, which represents the southern edge of the campus on an east-west alignment. These roadways are shown in Figure 2, Community Context.

Soldiers Field Road/Storrow Drive is a four-lane arterial roadway with grade-separated intersections adjacent to Harvard's Allston property at North Harvard Street, Western Avenue and Cambridge Street. This roadway forms the boundary for the Allston property owned by Harvard on the western, northern and eastern edges. Soldiers Field Road/Storrow Drive is a major route to and from downtown Boston.

North Harvard Street, which bisects the campus area, acts as the principal north-south collector in the vicinity. Parking is allowed along both edges of this street and there is one travel lane in each direction. Campus entry off North Harvard Street is provided to the east via Gordon Drive and to the west, southeast of the Stadium and directly into the athletics complex area.

Western Avenue, which forms the southern edge to the campus area, acts as the principal east-west collector in the vicinity. Parking is allowed along both edges of this street. Several campus entry points are located off Western Avenue. Refer to Figure 3, Existing Land Use. One entry is to the west of the intersection with North Harvard Street. To the east of North Harvard Street, entry points are located just to the east of WGBH and on both sides of the Soldiers Field Park garage. In addition, a gate-controlled entry to a surface parking lot is found mid-block.

The bulk of traffic related to the Allston campus is found at the intersections of these local access streets. In order to determine the level of significance of University-related traffic at these intersections, traffic volume counts were conducted at the intersections of North Harvard Street/ Western Avenue, Soldiers Field Road/North Harvard Street and Western Avenue/Soldiers Field Road. Traffic turning movement counts were taken at these locations on Wednesday April 13, 1988 during the hours of 7-9 AM, 11 AM to 1 PM and 4-6 PM. The day was chosen to represent peak traffic conditions when all classes are in session. The hours of the day represent the morning, noon and afternoon peak travel times.

To determine the existing operating conditions at the intersections studied, a Level Of Service (LOS) analysis was conducted based on methods outlined in the Highway Capacity Manual (Transportation Research Board Special Report 209, 1985). For signalized intersections the Highway Capacity Manual defines level of service in terms of the average stopped delay per vehicle. Delay is a measure of driver discomfort, frustration, fuel consumption and lost travel time. The Highway Capacity Manual establishes six Levels of Service, as follows:

1) Level of Service A (0 to 5 seconds delay) represents free flow with little delay and/or stopping.

1 Harvard Allston Campus
2 Residential
3 Allston Landing
4 Public Parkland
5 Mixed - Commercial, Office, Light Ind.
6 W.G.B.H.
7 N.E.D.L.

Harvard University
Allston Campus Master Plan

Community Context

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Figure 2

2) Level of Service B (5 to 15 seconds delay) has slightly greater delays and stopping.

3) Level of Service C (15 to 25 seconds delay) has stable flow and acceptable delays.

4) Level of Service D (25 to 40 seconds delay) has unstable flow, lengthy delays and noticeable congestion.

5) Level of Service E (40 to 60 seconds delay) has congested flow, and represents the highest delays drivers will tolerate.

6) Level of Service F (60+ seconds delay) has delays which are unacceptable.

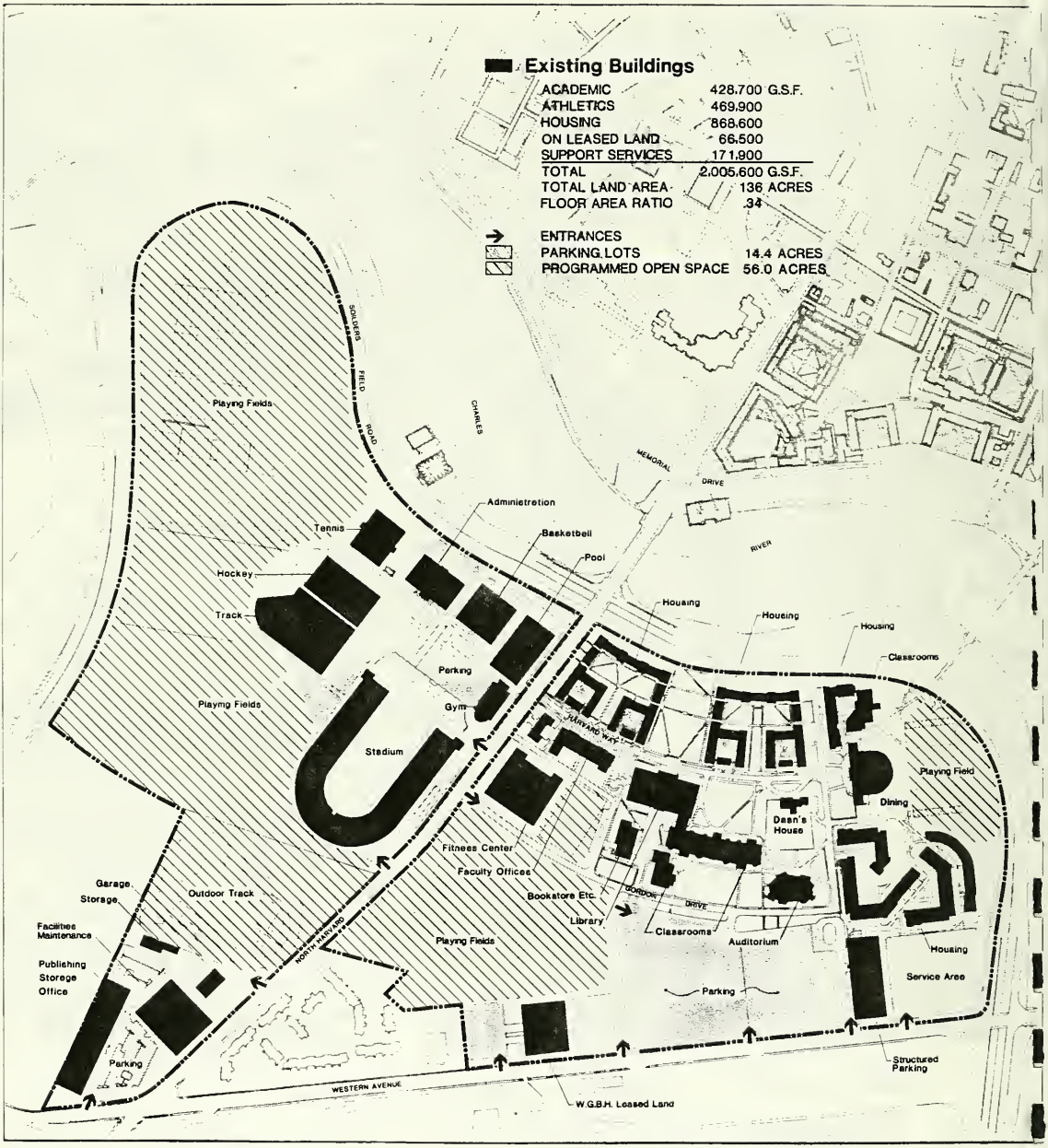
Although design standards are not given for levels of service in the Highway Capacity Manual, the American Association of State Highway and Transportation Officials and others generally regard level of service D as an acceptable condition for peak hours (the time which represents worst-case traffic conditions) at urban intersections.

Soldiers Field Road/North Harvard Street is a signal-controlled compound intersection consisting of the eastbound and westbound ramps of Soldiers Field Road and the northbound and southbound approaches of North Harvard Street. The eastbound Soldiers Field Road exit ramp includes two lanes which function as an exclusive left turn lane and a combination through/right lane. The westbound Soldiers Field Road exit ramps entail two lanes which function as an exclusive right turn lane and a combination through/right lane. The northbound North Harvard Street approach to the intersection entails two lanes, one of which accommodates moving traffic and one which is often occupied by illegally-parked vehicles. The southbound North Harvard Street approach over the Charles River, consists of two lanes which generally operate as an exclusive left-turn lane and a combination through/right lane. The eastbound and westbound ramps are offset by the width of Soldiers Field Road, so left-turning vehicles from these ramps conflict with each other, and due to their heavy volumes must move on separate signal phases. To accommodate the heavy southbound left turns onto Soldiers Field Road, the southbound approach receives an additional advance phase over the northbound.

The levels of service and associated average vehicle delays for the intersection of North Harvard Street at the Soldiers Field Road ramps for the peak hour within each of the time periods studied are shown in Table 1.

Table 1. Levels of Service, Soldiers Field Road/North Harvard Street Intersection

Scenario	AM PEAK LOS	AM PEAK Delay in Seconds	MIDDAY PEAK LOS	MIDDAY PEAK Delay in Seconds	PM PEAK LOS	PM PEAK Delay in Seconds
Existing Conditions	F	144	D	38	F	194
W/Recommended Modifications	D	36	C	17	D	31



Harvard University
Allston Campus Master Plan

Existing Land Use

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Figure 3

As shown in Table 1 under Existing Conditions (which assumes existing signal phasing and timings and with vehicles parked along the northbound North Harvard Street approach) the intersection functions at a level of service "F" during the morning and afternoon peak hours. If parking were to be removed and the signal timings modified to more appropriate phasings (recommended modifications), acceptable levels of service of "D" or better could be provided for existing volumes. This analysis does not address the possibility of backups from Memorial Drive in Cambridge which could be a constraining factor if the existing bottleneck at North Harvard Street and Soldiers Field Road is removed. With the suggested improvements additional traffic capacity would be provided. However, the intersection would accordingly have limited capacity for future traffic growth.

Soldiers Field Road/Western Avenue is a signal-controlled intersection including the eastbound and westbound ramps of Soldiers Field Road (which are oriented south and north, respectively) and the eastbound and westbound approaches of Western Avenue. The eastbound Soldiers Field Road exit ramp entails two general purpose lanes serving vehicles continuing through on the Service Road and making right turns onto Western Avenue westbound. Left turns are not possible since Western Avenue over the Charles River is one-way westbound. The westbound Soldiers Field Road Service Road consists of two left-turn lanes and a single through lane. The eastbound Western Avenue approach consists solely of a free-flowing channelized right-turn lane. The one-way westbound Western Avenue approach over the Charles River consists of two left-turn lanes to the eastbound Service Road and two through lanes. The signal provides for three separate phases: the first phase accommodates westbound Western Avenue traffic; the second phase accommodates westbound Soldiers Field Road Service Road traffic; and the third accommodates eastbound Soldiers Field Road exit ramp traffic. Eastbound Western Avenue traffic is channelized within a right-turn lane which moves on all phases.

The levels of service and associated average vehicle delays for the intersection of Western Avenue and the Soldiers Field Road ramps for the peak hour within the time periods studied are shown in Table 2.

Table 2. Levels of Service, Soldiers Field Road/ Western Avenue Intersection

	AM PEAK		MIDDAY PEAK		PM PEAK	
	Delay in		Delay in		Delay in	
Scenario	LOS	Seconds	LOS	Seconds	LOS	Seconds
Existing Conditions	E	42	B	15	F	76
W/modified signal timings	D	26	B	15	E	57

As shown in Table 2 under Existing Conditions, which assumes the existing signal timings and the presence of parked vehicles along both sides of Western Avenue, the intersection functions at a level of service "F" in the afternoon peak hour, and at level "E" during the morning peak hour. With signal timing adjustments (modified signal timings) the intersection could function at acceptable levels in the morning and at capacity in the afternoon peak hour. In addition, the removal of parking on the north side of Western Avenue would allow traffic exiting the intersection to flow more smoothly. Even with the suggested improvements the intersection will be at its practical capacity, thus limiting future traffic growth.

North Harvard Street/Western Avenue is a signal-controlled intersection consisting of the eastbound and westbound approaches of Western Avenue and the northbound and southbound approaches of North Harvard Street. Approaches are wide enough to accommodate a single moving lane and also provide for storage for left-turning vehicles. Parking is restricted on all approaches in the immediate vicinity of the intersection, but on-street parking is allowed within a short distance of the intersection. The signal operates in two-phases, showing green alternately on Western Avenue and on North Harvard Street. The levels of service and associated average vehicle delays for the intersection for the peak hours within the time period studied are displayed in Table 3.

Table 3. Levels of Service - North Harvard Street/ Western Avenue

	AM PEAK		MIDDAY PEAK		PM PEAK	
Scenario	LOS	Delay in Seconds	LOS	Delay in Seconds	LOS	Delay in Seconds
Existing Conditions*	B	14	B	9	B	11

*Observed exceptions C/D

The delays and levels of service indicate very good operating conditions at the intersection at all times of day, and thus volume is not an issue. While those persons observing the traffic at this intersection did generally observe good operating conditions, with traffic typically passing through the intersection within the signal cycle in which it arrived, at certain times traffic operations became constrained. At those times congestion developed for a variety of reasons including:

- MBTA buses stopping and obstructing traffic either entering or exiting the intersection,
- the attempt of traffic to exit the intersection in two through lanes which required the merging of those lanes into a single lane with the incidence of on-street parking, and
- through vehicles becoming trapped behind left-turning vehicles in the de facto left turn lane.

The net result of these situations is that vehicles are, at times, prevented from being served within the cycle in which they arrive indicating an operational Level of Service "C/D". Each of these operational constraints could be addressed by the institution of pavement striping designating a left turn storage lane eastbound, the enforcement of lane use, and the enforcement of legal parking. With regulation and removal of some parking near the intersection there is adequate capacity for traffic growth within the intersection.

Summary of Traffic Recommendations

The intersection of Soldiers Field Road/North Harvard Street should be improved by removing parking on North Harvard Street for a sufficient distance from the intersection, allowing for two lanes northbound to be provided. Even with this alteration the intersection is virtually at capacity in the peak hour and could accommodate only a small increase in traffic.

The intersection of Soldiers Field Road/Western Avenue could be improved by removing parking on the north edge of Western Avenue near the intersection. Even with this alteration, the intersection is virtually at capacity and could accommodate only a small increase in traffic.

The intersection of Western Avenue/North Harvard Street should and does function well during most of the peak hour. When it is congested, it is largely due to illegal parking and bus operations, and improper driver operation. With proper lane designation and enforcement there is adequate capacity to accommodate additional traffic growth at this intersection.

B. Parking

The existing University parking supply in Allston serves both the on-site user groups in Allston (Harvard Business School, Athletics, Soldiers Field Park housing, etc.) and a portion of the University population located in Cambridge. Parking is administered by the University as a university-wide resource and a permitting system with specific lot assignments is employed.

The current parking supply located in Allston totals 2,252 spaces. Of that number, 794 spaces are in structured parking (Soldiers Field Park garage) and the balance of 1,458 spaces are located in surface parking lots. Included within the total parking supply are 24 handicapped parking spaces. The total number of parking spaces may vary slightly from time to time through additions and deletions caused by modifications to parking layout/striping, relocation of guest spaces and drop-off spaces, landscaping programs and adjustments to parking lot entries.

Inventory of On-Campus Spaces

The supply of parking on the Harvard University Allston Campus consists of controlled and uncontrolled parking in University lots and garages. In addition, there is a perception that the on-street parking supply along Western Avenue and North Harvard Street between their intersection and Soldier's Field Road, as well as certain streets in the Allston neighborhood are being used by Harvard-affiliated persons as part of the functional parking supply. For this reason an inventory of Harvard lots and neighborhood streets identified by the Mayor's Office of Neighborhood Services was conducted to determine the inventory of spaces. The supply was found to encompass the following facilities.

The Soldier's Field Park Parking Garage is a seven-level parking structure available on a permit-only basis to faculty, students and staff of the University. The garage provides for 794 spaces. The entrance to the garage is by a card-controlled gate and is located on the west side of the structure approximately 200 feet from Western Avenue, providing for more than sufficient stacking space for entering and exiting vehicles.

The Harvard Business School Lot is a surface lot located on Western Avenue and available to faculty, staff, students and visitors to the University. The lot provides for 1,077 spaces in total, which are marked for separate areas of 497 spaces for faculty and staff, 372 spaces for resident students and 208 spaces for commuter students. Entry is through card-controlled gates with visitors accommodated by an attended gate. There are seven entry and exit gates, with the primary access via two driveways on Western Avenue. A significant amount of space turnover occurs within this lot during the day as commuting students, faculty and staff arrive at and depart the campus.

The Soldiers Field Park Visitor Lot is a surface lot consisting of spaces surrounding the Soldiers Field Parking Garage. The lot includes twelve spaces northwest of the garage, 31 spaces to the east of the garage and ten spaces designated for drop-off/pick-up at the Day Care Center. The visitor spaces east of the garage and the day care center parking spaces are accessed via an entrance east of the garage, and the spaces in the northwest are accessed via the garage driveway on Western Avenue.

The Briggs Athletic Center Lot provides for 92 spaces available to persons using the athletic facilities. It is accessed via North Harvard Street.

The Dillon Field House Lot is a surface lot entailing 46 spaces fronting on Soldiers Field Road and available to persons with business at the Athletic Department. It is accessed via internal site roads which connect with North Harvard Street.

The Facilities Maintenance Lot is a surface lot of 47 spaces striped for general use, and miscellaneous other spaces available for storage of University maintenance vehicles and various service and delivery trucks (which should not be included in the parking supply). The lot is accessed directly from North Harvard Street or via a connecting roadway between the Printing Office Lot and Western Avenue.

The Printing Office Lot is a surface lot providing 143 spaces made available for those with business in the printing building. The lot is accessed directly via Western Avenue, or indirectly via Western Avenue and through the Buildings and Grounds Lot.

In summary, the Harvard University Allston Campus has a total supply of 2,252 spaces controlled by the University.

Inventory of On-Street Spaces

Western Avenue between North Harvard Street and Soldiers Field Road contains a total of 223 spaces available along the north and south curbs. North Harvard Street between Western Avenue and Soldiers Field Road contains a total of 210 spaces available along the east and west curbs. In addition to the public streets adjacent to the Allston Campus an inventory of spaces on public streets in the Allston neighborhood was conducted. Table 4 displays the streets identified by the Mayor's Office of Neighborhood Services to be covered within the inventory, and the number of available curb parking spaces.

Parking Space Utilization

All Allston Campus and on-street spaces described above, with the exception of the Harvard Business School (HBS) Lot, were part of a survey of parking utilization that was conducted between 8 AM and 6 PM on Wednesday April 27, 1988. The survey consisted of tours of the parking spaces on an hourly basis to record the license number or Harvard permit numbers of vehicles parked in every space. This made it possible to determine the peak percentage of space occupancy. For the HBS Lot, similar information was available via parking gate records from March 30, 1988.

For the various categories of spaces the findings of the survey are shown in Table 5.

Table 4. Neighborhood On-street Parking Spaces

Street	*Spaces*
Riverdale - from Western to Raymond	29
Franklin - from North Harvard to Myrick	28
Raymond - from Franklin to Riverdale	17
Weitz - from Franklin to Bayard	25
Bayard - North Harvard to Myrick	55
Rena - North Harvard to Travis	26
Kingsley - North Harvard to Travis	32
Bertram - North Harvard to Travis	13
Travis - Rena to Western	22
Total	247

Table 5. Peak Occupancy

University Lots	*Peak Occupancy*
Soldiers Field Parking Garage	59%
HBS Lot	78%
Athletics	97%
Printing Building and Grounds	65%
Public Streets	
Western Avenue and North Harvard Street	94%
Allston neighborhoods	54%

The existing overall parking supply on the Allston campus is less than 75 percent occupied during the period of peak demand. Of the various components of the supply, only the Athletic Lots at 97 percent occupancy at midday can be characterized as approaching full utilization. The only public streets which are at capacity are Western Avenue and North Harvard Street, on-street spaces of which were fully occupied for the entire 8 AM to 5 PM study period.

Parking within the 794-space Soldiers Field Park garage is currently less than 60 percent utilized at peak occupancy. MASCO leases approximately 350 spaces within the garage for use in the MASCO shuttle bus system. However, only 150 permits have been issued by MASCO. The 190 spaces next to Facilities Maintenance and the Printing Office on North Harvard Street have only 60 permits issued by the University and spaces are usually available. In addition, land that has been reserved for the long-term development of Soldiers Field Park II housing east of the parking garage has not been included in the existing parking count. However, this area may be available for temporary parking as replacement for spaces lost during construction activities at other locations.

In summary, peak occupancy data indicates that there is a surplus of parking spaces in the HBS lot of 237 spaces; in the Soldiers Field Parking Garage of 326 spaces and in the Printing Office and

Facilities Maintenance lots of 66 spaces (not including 50 spaces currently unassigned and used for service functions). In total, this surplus amounts to nearly 630 spaces.

Allston Campus Parking Demand

Of the 2,252 parking spaces in Allston, 1,871 spaces are located in the Soldiers Field Park garage and the Western Avenue surface lot, both of which require University parking permits. The total number of parking permits issued by the University in the Western Avenue Surface Lot is 1,715. While slightly less than the actual supply, the allocation of permits recognizes the need for parking for 200 visitors each day. The total of University permits plus visitors can exceed the existing parking supply because of the shared-use characteristics of the University parking demand, where a significant turnover of spaces occurs throughout the day. This is consistent with existing University parking policy that allows the allocation of more total parking permits than there are total parking spaces in a given parking facility, which recognizes the variety of individual parking needs in terms of duration and time of day/night.

The total number of parking permits issued on the Allston campus, when compared to the Allston campus population as a whole, results in the following findings regarding permit holders:

- 71% of the faculty hold permits,
- 33% of the students hold permits, and
- 41% of the staff hold permits.

The University's current policy is to issue permits to all persons desiring one. Thus the percentage of permits issued reflects total demand.

The Incidence of On-Street Parking Among Harvard-Related Vehicles

In addition to those vehicles with permits for campus lots, there is the perception that a portion of the Harvard population parks on public streets. In order to test this premise, a statistically-valid sample of the license plate information obtained in the utilization study. These were processed to obtain the name and address of the owner, following which University enrollment and employment records were examined to determine whether the owner had an affiliation with the University. The results of this procedure are displayed in Table 6.

Table 6. Harvard - Related Vehicles In On-Street Spaces

Location	Number Vehicles Parked	Number Harvard Vehicles	Percent Harvard
Allston Neighborhoods	134	16	11.9%
Western Avenue	210	42	20.0%
North Harvard Street	197	33	16.8%
Total	541	91	16.8%

On streets in the Allston neighborhoods the sample survey showed that approximately 12 percent of the parked vehicles were affiliated with Harvard. Applying the percentages shown above to the appropriate public streets indicates that an additional 91 vehicles (or 5% more vehicles than at present) would need to be accommodated in Harvard lots if on-street parking were not available. Given the previously identified surplus of 630 spaces, these on-street vehicles could be accommodated within the existing Harvard parking supply.

Peak Parking Occupancy by Permit-Holder Group

Assuming peak space occupancy data from the HBS Lot is typical for the Allston Campus parking network as a whole, the actual number of parking stickers by permit-holder group in use at the time of peak occupancy may be determined. The results of this data display that:

- 45% of the faculty permits are in use,
- 66% of the student permits are in use, and
- 60% of the staff permits are in use.

Significant numbers of students use their permit for long-term vehicle storage and their space occupancy is accordingly the highest. Given the varying schedules of the faculty, their usage is the lowest.

Summary

The peak occupancy data of the various Allston Campus parking facilities indicates that there is a existing surplus of University-controlled spaces, and analysis of vehicle registrations indicates that Harvard-related vehicles constitute a small percentage of the vehicles parked on public streets in Allston.

The comparison of permits issued to the number of permits in use at peak occupancy allows a determination of the appropriate ratio of parking spaces per person in each user group. This ratio is the product of the percentage of the user group with permits multiplied by the percentage of those permits in use at periods of peak occupancy. These products have been increased by an additional five percent to represent the accommodation of Harvard vehicles parked on public streets. By user group those ratios are:

Faculty: .34 spaces per person
(71% with permits x 45% permits in use at peak x 1.05 on-street factor)

Students: .23 spaces per person
(33% with permits x 66% permits in use at peak x 1.05 on-street factor)

Staff: .26 spaces per person
(41% with permits x 60% permits in use at peak x 1.05 on-street factor)

It is significant to note that these ratios fall within ranges which are typically found in national surveys of university parking activity. Ratios of .20 spaces per person for universities in areas with good transit (urban) access have been cited in a number of publications and ratios of .35 to .50 spaces per person are suggested within areas with little or no transit access (suburban/rural).

C. Transit Use

A pair of surveys were conducted to determine the modes other than private vehicles which the Allston Campus population employ to access the campus. The first was a survey by mail of non-permit holders at the Harvard Business School. The second survey involved intercept interviews conducted at two locations on the campus. The results of the two surveys and the modes used in accessing the Allston campus are presented in Table 7.

Table 7. Allston Campus Access Modes

Mode	% Faculty	% Commuter Students	% Staff	% Visitors
Drove auto	67%	34%	49%	43%
Public Transit	12%	26%	18%	18%
Walk	11%	16%	16%	18%
Other*	10%	24%	17%	21%

* Includes auto passenger, taxi riders, or bicycle riders.

It should be noted that the percentages of individuals who indicated that they drove an auto to the campus are in fact similar to the percentages previously identified as holding parking permits.

Harvard University operates a shuttle bus as well as a handicapped van service on both the Allston and Cambridge Campus seven days a week between the hours of 8:00 AM and 1:00 AM. The service entails six runs, one of which serves the Allston Campus at a headway of 50 minutes. The ridership counts for the combined service for the month of March, 1988 was approximately 2,000 riders per day on the shuttle bus service and approximately 45 riders per day on the handicap van service.

The University also operates an MBTA pass program which is open to all full-time faculty or staff members. The University subsidizes ten percent of the cost of each pass. During the month of April, 1988, 14.7% of the University population were MBTA pass holders through this program.

III. The Five Year Plan

A. Circulation

Harvard University intends to maintain an appropriate vehicular access system to the Allston property to serve students, faculty and staff. The local arterial streets which currently serve the campus (North Harvard Street, Western Avenue) will continue to be the backbone of the circulation system that feeds the campus.

The amount of new traffic destined for the campus, in addition to that currently generated, is not expected to increase significantly in the next five years because new facilities proposed as part of the Five Year Plan are not driven by student enrollment or faculty increases. It is not planned that the total on-campus population will change significantly over the five year period. The proposed OIT program of 84,000 s.f. in the Five Year Plan will consolidate 230 University employees located in both Allston and Cambridge into the Allston area. Only those employees who currently work in Cambridge and who do not drive through Allston will be an increase in traffic in the area but their numbers are not substantial enough to cause significant influence on the existing traffic patterns, especially with the availability of mass transit.

In the Five Year Plan, the campus entry points to the Allston property will remain essentially as they are today. Along North Harvard Street, entries to the west will continue to be provided directly into the athletics area, south of the football stadium, and south of the outdoor track area. However, with the proposed demolition of Carey Cage, the entry area to the athletics complex will be redesigned to provide an appropriate drop-off area for visiting teams, event participants, etc. Entry to the campus east of North Harvard Street will continue to be limited to Gordon Drive. Entries from Western Avenue to the north will include; one to the west of the intersection with North Harvard Street: another immediately to the west of WGBH; one opposite Hague Street; and entries on both the east side and west side of the Soldiers Field Park garage. The entry from Western Avenue to the west of North Harvard Street will provide direct access to the proposed O.I.T. facility. Delivery traffic coming to the Chilled Water Plant will enter both from North Harvard Street onto Grodon Dive and from Western Avenue.

The internal campus circulation network is not anticipated to change significantly during the five year period. Gordon Drive will provide for the major east/west movement of vehicles to the campus area east of North Harvard Street. The other campus entry points lead directly to parking facilities, most of which will be gate controlled from Western Avenue.

B. Parking

Under the Five Year Plan, parking requirements will be accommodated through a combination of construction of new spaces, increasing the efficiency of existing parking areas and use of currently underutilized parking areas. The parking supply at the end of the Five Year period is estimated to be 2,290 spaces. Beyond the Five Year Plan as the existing parking supply approaches full utilization, additional spaces will be needed for new buildings that bring new users to the Allston campus. However, for the Five Year period, the parking supply will continue to be provided in surface parking lots at the campus periphery. Existing University permitting policies are expected to

continue based on management of parking as a University-wide resource. In the long term the University will consider alternatives to the construction of additional structured parking in Allston to defer as long as possible the commitment of scarce land resources and financial resources to structured parking.

Examination of the IPOD parking requirements indicates that in certain cases the parking standards are in excess of that likely to be generated by the uses anticipated by the University in the Five Year Plan. The IPOD parking requirements include new interim parking rules for general institutional uses, offices and housing. In the case of institutional uses and offices, the parking requirement has been established at one space per 650 square feet of building. This is slightly more intensive than the previous zoning requirement of 1 space per 700 square feet of building. Housing parking rates have increased significantly from a previous rate of .9 spaces per dwelling unit to 2 spaces per dwelling unit under the IPOD. In the case of University housing, a dwelling unit is interpreted to be 4 students beds. Table 8 summarizes the IPOD and Pre-IPOD parking requirements.

Table 8. IPOD and Pre-IPOD Parking Requiremnets

USE TYPE	IPOD	PRE-IPOD
Housing/Residential Uses	2 spaces/dwelling unit*	.9 spaces/dwelling unit*
Non-Residential - Office, Research, Classroom, Etc.	1 space/650 gross square feet	1 space/700 gross square feet

*dwelling unit defined as 4 student beds.

Experience over all campuses of Harvard indicates the current demand for parking is one space per 1,800 square feet of institutional space and less than one space per housing unit (4 beds). On the Allston campus the demand for parking has been surveyed at one space per 900 square feet of institutional space and one space per 2.5 students beds. These rates do not necessarily provide a reasonable demand for specific projects since the uses contained within any individual project can vary considerably. It is recommended that parking requirements be assessed on a case by case basis. In this way, requirements for parking spaces can best match demand and will not cause excess parking to be provided that could act as a disincentive for mass transit useage and promote driving.

The following discussion identifies the parking requirements recommended for each of Harvard's Five Year Plan program elements and describes what will be undertaken to accommodate the parking demand.

. Business School (Morgan/Baker/Cumnock) Renovations: No additional parking is required because these projects are essentially providing improved/renovated office space for the existing faculty and staff. These projects will not displace any existing parking.

. Chilled Water Plant: The 20,000 g.s.f. facility will require no additional automobile parking. The facility will displace an estimated 34 existing parking spaces in the Western Avenue Surface lot. The displaced spaces are proposed to be relocated next to the chilled water plant along the entry drive. A suitable truck service road, service docks and service van parking will be provided.

. Racquet Courts Building: No additional parking is required because the racquet facility will serve an existing user group. Existing displaced parking, 58 spaces, will be replaced within the athletic complex area in front of the indoor track building.

. OIT: Based on the 1 space/650 g.s.f. criteria of the IPOD, the first phase of OIT (84,000 sq. ft.) would have to provide 129 new parking spaces. Currently the University has issued 60 permits for parking in this area which will be maintained in the parking supply. Thus, the total parking requirement would be 189 spaces. The University has calculated the total OIT parking demand as 121 new parking spaces based on OIT employee survey information indicating that of the 230 employees 59% will drive to the facility and that on the average day 85% of the employees will be on-site and that seven (7) visitor spaces will be required. Thus, including the 60 permitted spaces the total parking recommended to be provided is 181 spaces.

C. Impact of the Proposed Projects on the Community

Traffic

The Five Year Plan proposes projects which, except for OIT, will have essentially no impact on the existing traffic patterns.

The OIT building will accommodate approximately 230 employees, of which slightly more than half are expected to drive to work, with a peak hour contribution of 75-90 vehicles. The Traffic and Parking Study (6/1/88) undertaken as part of the Master Plan, indicated that travel patterns of the University-related traffic is evenly split between the intersections of North Harvard/Soldiers Field Road, Western Avenue/Soldiers Field Road and North Harvard/Western Avenue. Continuing this pattern, the impact of the OIT building on local traffic patterns will not be significant.

The University shares the desire of the community (as expressed by the Master Plan Task Force), to eliminate parking on North Harvard Street and portions of Western Avenue to improve overall traffic flows.

Parking

Similar to traffic, most of the Five Year Plan program elements have very little impact on parking demand because they serve existing University populations or are essentially physical plant service improvements.

OIT will shift (230 persons) University population to the Allston campus. Thus, additional parking demand will be created specifically related to this facility. The parking ratio of 1 space/694 gross square feet of building will meet the parking needs of this project and will be accommodated on-site.

Existing parking impacted (i.e. displaced) by the proposed program elements will be replaced or re-assigned to existing under-utilized parking facilities. The Traffic and Parking Study (6/1/88) indicated more than sufficient existing parking supply to absorb the additional demand caused by displaced parking.

The University supports the elimination of parking on North Harvard Street and portions of Western Avenue as expressed by the community (through the Master Plan Task Force). Because the

University currently has under-utilized parking facilities on the Allston campus, those University affiliated persons who park on either of these streets can be accommodated in the University Parking supply. To protect the adjacent neighborhoods, should parking be reduced along these streets, the University supports a resident sticker program for those streets likely to be affected. In addition, the University will consider the possibility of making parking available to Allston-Brighton residents in the off-peak, should parking be removed from North Harvard Street and Western Avenue.

IV. The Long Range Goals

A. Circulation

The basic system of access to the Allston property is expected to remain essentially the same as it is today. Modifications will be directed at the adjustment to campus entry points to better facilitate vehicular access and service to identified campus development areas. The existing campus access drive located across Western Avenue from Hague Street will continue to be studied to determine if a shift to the east along Western Avenue is appropriate. This will become a main entry drive from the south to the campus area.

Evaluation of the traffic generated as part of the long range development of the campus is dependent upon the amount and type of development proposed. Because the University cannot specifically identify the amount or type of uses at this time, it is not possible to identify future traffic levels generated by the campus in the long term outlook. However, the evaluation of existing conditions indicate that key road segments and intersections around the University do have some residual traffic capacity. In addition, improvements to intersections could be undertaken as they are demonstrated to be needed as a result of University development or development within the Allston community as a whole.

B. Parking

Parking provisions for the long range development of the campus are subject to such variables as: specific categories of land development required by the University in the future, potential changes in zoning requirements, development of public transportation to accommodate Allston development, and finally, changes in University parking policies relative to pricing and space assignments.

For this reason, long range parking strategies can only be discussed in terms of general policy rather than specific projections.

It is anticipated that parking will continue to be predicated on four basic assumptions:

- The University will continue to administer and assign parking as a University-wide resource.
- The actual number of new parking spaces to be provided by each project will be evaluated and addressed with the City on a case-by-case basis.
- Existing permitted parking spaces that are displaced by new building/program will be replaced.
- Surface parking lots will gradually be replaced by structured parking facilities.

In the long range term, the University intends to continue to administer parking supply on a University-wide basis. Parking is a resource that is shared by many entities within Harvard and parking supplies are strategically located to service a wide range of needs. Thus, the parking resources of the University are much like University housing, athletics facilities and basic services which are administered as University-wide resources.

As a result of the limited land available to the University for development either in Cambridge or in Allston, plus the University commitment to maintaining programmed field space, University parking

policies will, in time, lead to the transition from surface parking to structured parking facilities. The form of the structured parking facilities could be above ground or below ground, depending on cost and the exact pattern, type and intensity of campus development.

The University recognizes that many influences on the demand for parking in Allston will occur that are directly influenced by the University and others that the University has little influence over. As the Allston property continues to develop, the University will continue to explore and implement parking management and mitigation measures as part of an ongoing master plan process. Some of the areas that the University can investigate are:

- Permitting and pricing policies for University operated parking.

- Satellite parking lots.

In addition, the University will encourage mass transit programs for faculty, staff and students and carpooling/van pooling programs. Area-wide influences on parking demand beyond the control of the University will include:

- Areawide development and associated mass transit improvements.

- Remote parking facilities at MBTA Stations (Alewife) which provide de facto satellite parking facilities.